

Taguchi Method Approach for Recycling Chip Waste from Machining Aluminum (AA6061) Using Hot Press Forging Process

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Abstract. This paper investigates the recycling waste aluminum alloy 6061 from high speed machine (HSM) machine using hot forging process. Hot forging process was able to recover the grain structure of material by controlling certain pressure and temperature. The experiments conducted adopted Taguchi method design. Three factors selected are chip size, operating temperature and operating pressure with three levels for each factor. Both factors for operating temperature and pressure were directly controlled from hot forging machine. The chip sizes were prepared from HSM machine using three machining parameters with constant cutting speed and manipulate three levels for each parameter for feed rate and depth of cut. The final result between reference and experiment specimen showed the close gap in the tensile test. The main effect, signal to noise ratio and analysis of variance were employed to investigate the results and to establish the optimum parameters for hot forging process. It can be concluded that the hot forging process was able to recycle waste (chip) aluminum compared to the current recycling aluminum process.